Assignment - III

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Q), $f(x,y) = 3x^2 + 5e^{-y} + 10$

Ans Step-1 :- Initialization

$x=1, y=1$, epochs=2, $\eta = 0.2$

iteration 1

$$\frac{\partial f}{\partial x} = 6x = 6$$

$$\frac{\partial f}{\partial y} = -5e^{-y} = -5(0.36) = -1.8$$

$$\Delta x = -\eta \frac{\partial f}{\partial x} = -(0.2)(6) = -1.2$$

$$\Delta y = -\eta \frac{\partial f}{\partial y} = -(0.2)(1.8) = 0.36$$

$$x = x + \Delta x = 1 - 1.2 = -0.02$$

$$y = y + \Delta y = 1 - 0.36 = 0.64$$

iteration 2

$$\frac{\partial f}{\partial x} = 6x = 6(-0.02) = -0.12$$

$$\frac{\partial f}{\partial y} = -5e^{-0.64} = -2.63$$

$$\Delta x = -\eta \frac{\partial f}{\partial x} = (-0.2)(-0.12) = 0.024$$

$$\Delta y = -\eta \frac{\partial f}{\partial y} = -(0.2)(-2.63) = 0.526$$

$$x = 0.024$$

$$y = 0.526$$